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ABSTRACT

Seafood information pertinent to the needs of school food service personnel is presented. Each of five sections contains information considered important by school food service managers and supervisors as indicated in a national survey (1977). Provided in section one are a narrative section, graph, and chart on seafood nutritive value. The next section on seafood selection describes (1) market forms of fresh and frozen fish, (2) physical characteristics of fresh whole/filleted fish, (3) such purchase criteria as availability, market forms, quantity, and inspection, and (4) writing specifications for bidding. Storage of seafood is covered in section 3. Included in the preparation information given in section 3 are charts, illustrations, and a narrative section on thawing, cooking, and serving seafood. Suggestions on how school food programs can cooperate with classroom teachers to provide nutrition education are listed in section 5 which includes learning activities and resource agency addresses. A short bibliography is appended. (CE 025 857 is a seafood products instructional guide for home economics programs and CE 025 859 is a seafood products guide for occupational food service programs.) (MN)

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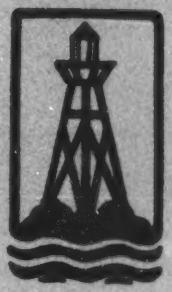

SEA GRANT
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

SEAFOOD MANUAL FOR SCHOOL FOOD SERVICE PERSONNEL

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Anita H. Webb

DE 025 858

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INTRODUCTION

The purpose of this manual is to provide seafood information pertinent to the needs of school food service personnel. Seafood is high in protein, reasonably priced, easy to prepare and well accepted by students. In a plate waste study, Judson Harper found that 5th grade students consumed 82.6% of the fish served, 78.9% of the beef, 75.6% of the chicken and turkey, and 66.7% of the pork and veal, while 10th grade students consumed 91.0% of the fish served, 88.7% beef, 87.2% pork and veal and 84.7% of the chicken and turkey.[1]

The manual is divided into five sections. Each section presents seafood information that is considered to be important by school food service managers and supervisors as indicated in a national survey (1977). Charts and diagrams within the sections give quick and easy reference.

Seafood recipes which have been adapted from Quantity Recipes for Type A School Lunches and other sources are available by writing:

Seafood Products Education Project
Sea Grant
Virginia Polytechnic Institute & State University
Blacksburg, VA 24061

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[1] Harper, Judson M. "Plate Waste." Paper presented at the Eleventh Annual Industry Seminar, American School Food Service Association, Vail, Colorado. January 25, 1977.

I. NUTRITIVE VALUE OF SEAFOOD

Finfish and shellfish are an important source of many nutrients needed in the diet. These nutrients include proteins, fats, vitamins and minerals.

Proteins

Protein builds and repairs body tissue and is essential for growth. The protein found in seafood contains all of the necessary components for these functions. In addition, seafood protein is easily digested and utilized by the body.

Fats

Fats provide the body with energy. Seafood is generally low in fat and therefore low in calories. The fat content varies widely with the type of fish and the season of the year. The fat levels range from less than 1% for lean fish like cod to as much as 20-25% for fat fish like mackerel. (The chart on page 4 lists fat content of fish.)

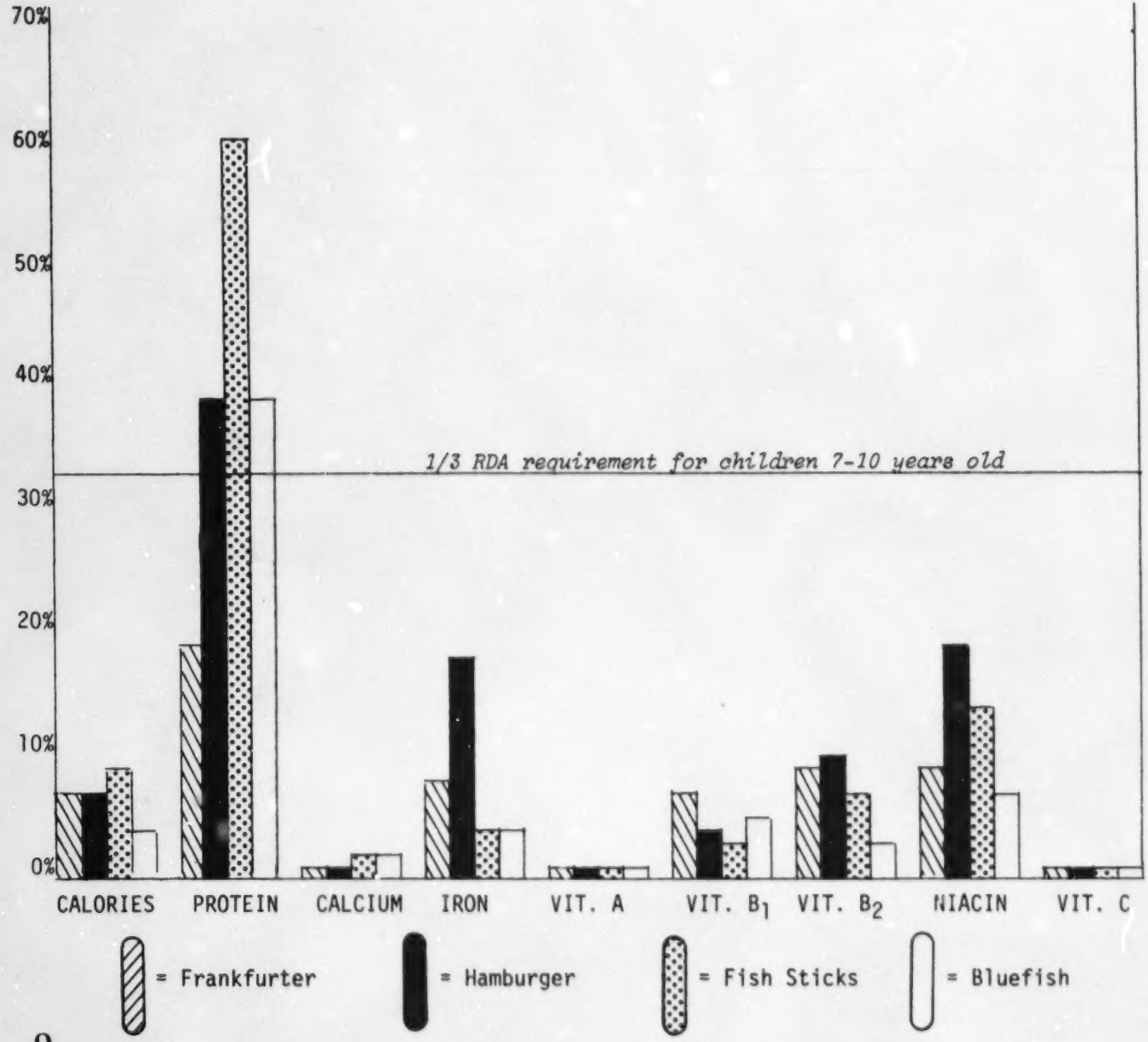
Vitamins

Lean and fat seafood contains useful amounts of the B-complex vitamins including thiamine, riboflavin and niacin. These vitamins maintain the health of nerve tissue and are used in the normal operation of the body's energy-yielding process.

Minerals

Minerals are essential for certain body functions and maintenance of sound teeth and bones. Seafood contains calcium, iron, potassium, phosphorus, copper, iodine, manganese, cobalt and other trace minerals.

For more nutritional information, see Nutrients and Foods for Health, FNS-97, May 1973.)



= % of RDA for 7-10 yr. old children contained in one 2 ounce meat or meat alternate serving of:

1. Frankfurter
2. Hamburger
3. Fish sticks
4. Bluefish

(Based on the 1974 US RDA, Food Buying Guide for Type A School Lunches, PA-270, Food Buying Guide Supplements 1 & 2, and Nutritive Value of Foods Home & Garden Bulletin #12.)

FAT CONTENT OF VARIOUS SPECIES OF FISH*

VERY LOW	LOW	MODERATE	HIGH
1 Ocean Perch	1 Croaker	1 Butterfish	1 Shad
1-2 Cod	1 Finnan Haddie	1 Common Eel	1 Roe
2 Halibut	1 Grouper	1-2 Herring	1-2 Mackerel
2 Lingcod	1 Haddock	1-2 Swordfish	
2 Rockfish	1 Porgy	1-3 Kingfish	
2 Sea Bass	1 Scup	1-3 Mullet	
	1 Common Sea Bass	2 Tuna (Albacore)	
	1 Sea Trout	2 Sablefish	
	1 Spot	2 Pacific Salmon	
	1 Striped Bass	3 Pompano	
	1 Whiting	4 Trout	
	1-2 Flounder		
	1-2 Sole		
	1-2 Smelt		
	1-3 Bluefish		
	1-3 Black Drum		
	2-3 Shark		
	3 Red Snapper		
	4 Carp		
	4 Catfish		
	5 Greenland Turbot		

*Very Low: Less than 2% fat; Low: 2-5% fat; Moderate: 6-10% fat; High: more than 10% fat. (Taken from Sunset Seafood Cookbook, pp. 8, 10)

KEY:
1 Eastern Coast
2 Western Coast
3 Gulf Coast
4 Lakes and Rivers
5 Imported

II. SELECTION OF SEAFOOD

Seafood that is carefully selected and purchased helps insure the success of the seafood meal. Once the menus are planned, high quality fish can be selected to meet protein requirements and menu specifications.

USDA Protein Requirements

Two ounces of an edible seafood portion as served is the specified serving for the Type A lunch pattern. This meat or meat alternative requirement may also be met by combining one ounce of cooked fish with one ounce of cheese, as in a fish sandwich with a breaded fish portion and cheese. In the new school food legislation, as proposed in the September 9, 1977, Federal Register, the serving size of meat and meat alternate change with different age groups.

Frozen Seafood

Frozen seafood should be solidly frozen when delivered. The packages should be free from drip or ice which may indicate that the fish has been thawed and refrozen. The fish inside the package should have no discoloration of the flesh--such as a brownish tinge or a white cottony appearance. In addition, there should be no strong "fishy" odor. The seafood should be wrapped in an undamaged moisture/vapor proof package with little or no air space between the fish and package.

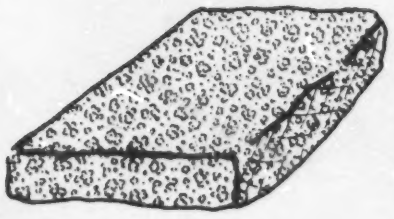
Frozen fish may be purchased in many forms. The most popular market forms of fish used in school food service are listed on the following chart.

MARKET FORMS OF FISH COMMONLY USED IN SCHOOL FOOD SERVICE

Portions

Raw Fish Portions

This product is cut to a specific size from frozen fish blocks.*



Raw Breaded Fish Portions

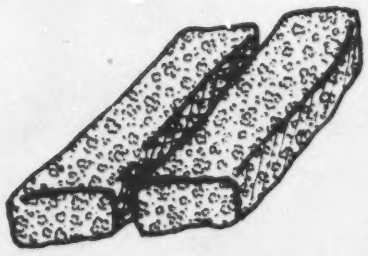
These portions are cut from frozen fish blocks*, then coated with batter, breaded, packaged and frozen. The portions weigh more than 1-1/2 ounces, are not less than 3/8 inch thick, and must contain at least 75% fish. The fish is ready to cook as purchased.

Fried Fish Portions

These portions are cut from frozen fish blocks*, coated with batter, breaded, partially cooked, packaged and frozen. The fried portions must weigh at least 1-1/2 ounces, be 3/8 inch thick and contain 65% fish. The fish is ready to heat and serve as purchased.

Sticks

Raw Breaded Fish Sticks



These sticks are cut from frozen fish blocks*, dipped in batter and coated with breading, frozen and packaged. The sticks are 3-4 inches long, weigh up to 1-1/2 ounces, are at least 3/8 inch thick and contain a minimum of 72% fish.

Fried Fish Sticks

Fish sticks are also cut from frozen fish blocks*, coated with batter, breaded, partially cooked, packaged and frozen. These sticks weigh up to 1-1/2 ounces, are not less than 3/8 inch thick and must contain at least 60% fish. The fish is ready to heat and serve as purchased.

(For additional information, see pages 65-68 of Food Purchasing Pointers for School Food Service, #1160.)

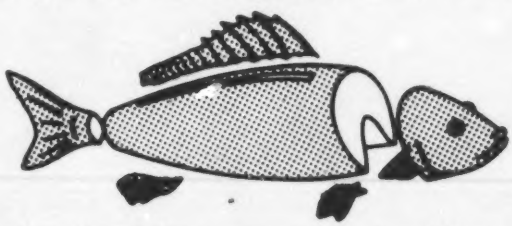
*Frozen fish blocks are rectangular shaped masses of cohesive single-species frozen fish flesh.

On occasion, a recipe may specify a form of fish not regularly used in schools. These are market forms which require more preparation time than fish portions and sticks. Of the forms listed below, fillets are the form most used by schools.

MARKET FORMS OF FRESH AND FROZEN FISH

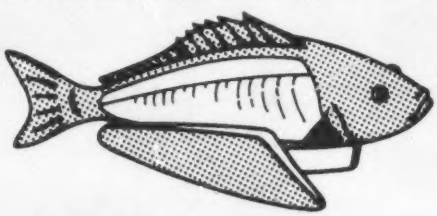
Whole

The fish as it comes from the water. Before cooking, the fish must be scaled and eviscerated. The head, tail and fins are usually removed. Then the fish may be cooked whole, filleted or cut into steaks or chunks.



Dressed

The scales and entrails are removed and usually the head, tail and fins. The fish is filleted, cut into steaks or chunks, or cooked dressed. A pandressed fish is a smaller fish which is ready to cook as purchased.

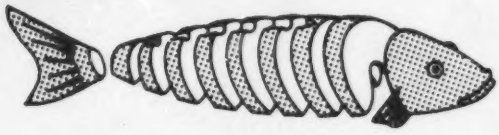


Fillets

The sides of the fish are cut length-wise away from the backbone. The fish is ready to cook as purchased. The fillets have few or no bones and may or may not be skinless.

The fillet cut from one side of the fish is a single fillet. This type of fillet is most common. Butterfly fillets are the two fillets of the same fish held together by uncut flesh and skin of the belly.

Steaks



Steaks are the cross-section slices from large dressed fish cut from 5/8 inch to 1 inch thick. The steak has a backbone cross-section and is ready to cook as purchased.

Chunks

Chunks are cross-sections of large dressed fish containing a small cross-section of the backbone. Chunks are ready to cook as purchased.

Canned Fish

Salmon, tuna and clams are often packed in cans. Since these canned fish are already cooked, they are convenient to use in preparing a wide variety of dishes.

Canned salmon are usually sold by the name of the species. These species differ in color, texture and flavor. The more expensive salmon varieties are deeper red in color and have a higher oil content.

Canned Pacific salmon is prepared from one of the following species of salmon:

1. Blueback, red, sockeye
2. Chinook, king. spring
3. Coho, Cohoe, medium red, silver
4. Pink
5. Chum, keta

The canned salmon is prepared in one of the following forms of pack: regular, skinless and backbone removed, minced, and tips and tidbits. The most expensive pack is the skinless and boneless pack while minced

salmon is the least expensive. The regular pack is the most used in school lunch programs since it is both less expensive and more readily available than the other packs.

In the regular pack, the sections or steaks are cut transversely from the salmon and filled vertically into the can. Segments of skin or large backbone may be removed during processing. The salmon sections or steaks are packed so the cut surfaces are even with the top of the can. The salmon is packed in 15-1/2 ounce and 64 ounce cans.

Canned tuna sold in the U.S. usually comes from one of the following species--albacore, big-eyed tuna, blackfin tuna, bluefin tuna, little tuna, oriental tuna, skipjack and yellowfin tuna. Tuna is prepared and canned in one of the following packs:

1. Solid pack: This pack consists of loins with no free pieces of tuna added. If necessary, a piece of tuna may be added to fill the can.
2. Chunk style: This pack is made up of pieces of tuna with the original muscle structure retained. The pieces may vary in size. At least 50% of the weight of the pressed contents of the container will be retained on a 1/2 inch mesh screen.
3. Flake or flakes: This pack consists of a mixture of tuna pieces with more than 50% of the weight of the pressed contents of the container passing through a 1/2 inch mesh screen, but the muscular structure is retained.
4. Grated: This pack is a mixture of tuna particles which have been reduced to a uniform size, will pass through a 1/2 inch mesh screen, and are discrete particles not comprising a paste.

The tuna is not only canned according to pack standards, but also according to color. The pack and color influence the cost of the tuna.

The more solid the pieces of tuna and the lighter the color, the more costly the product. In many recipes, color and size of the fish is not critical; therefore, the darker, smaller-piece tuna packs that are equally nutritious can be purchased. Tuna are designated to one of the following color categories: 1) white, which is the albacore species only, 2) light, 3) dark, and 4) blended. These packs and colors come packed in either water or oil. While the water pack is more expensive, it is lower in fat and calories. Canned tuna is purchased in cans of 60 to 66-1/2 ounce sizes. (For additional information on salmon and tuna, see pages 68-69 of Food Purchasing Pointers for School Food Service, #1160.)

Chopped canned clams are often used in soups, chowders and casseroles. These clams are packed in a 50 ounce can and have a drained weight 21-22 ounces.

Fresh Seafood

Most varieties of fish--as well as other foods--are more abundant during a particular season of the year. If possible, one should take advantage of the lower prices during peak seasons.

Fresh fish is usually purchased whole or in fillets (see Market Forms, page 7). While the cost of whole fish is less than fresh fillets, the waste factor--up to 50%--and time needed to fillet the fish take up the initial savings.

To insure buying seafood that is fresh, the fish should have the characteristics listed in the following charts.

Physical Characteristics of Fresh Whole/Filleted Fish

WHOLE FISH

	Fresh Fish	Deteriorated Fish
Eyes	Bright, clear, full	Cloudy, pink, sunken
Flesh	Firm, elastic	Soft, separating from bone
Gills	Red, free from slime	Pink, gray, brown
Odor	Fresh and mild	Strong "fishy" odor
Skin	Shiny, bright colors	Faded colors

FISH FILLETS

	Fresh Fillets	Deteriorated Fillets
Flesh	Fresh cut appearance	Brown, dried edges
Odor	Fresh and mild	Strong "fishy" odor

Selecting and Purchasing Seafood

When selecting and purchasing seafood for school lunch, many factors should be considered. Student acceptance along with the cost per serving make up a framework for selecting the menu. The actual seafood recipe to be prepared is a key factor in making subsequent decisions. Unless factors concerning type and form of fish best suited to the recipe are determined, a product that costs more than necessary may be purchased. Major points to examine are: availability, market form, quantity, inspection and grading.

1. Availability: Most forms of frozen and canned seafood are available throughout the year. Since fresh fish are seasonal, species will not be available at all times. Often, acceptable fish species substitutes at comparable prices may be found.
2. Market forms: There are many market forms (pages 6-8) and packs (see pages 8-10) of seafood available. Some of these forms of fish are more suitable for a recipe than others. Fillets are desirable for individual servings and flaked fish is preferable for a fish loaf, for example. In many instances, less expensive forms and packs may be used when factors such as color, texture and appearance are of less importance.
3. Quantity: The quantity of seafood purchased is influenced by the number of students eating the meal and their ages. The meat and meat alternate serving size varies with different age groups of the students and influences the amount of seafood purchased. An additional factor in determining quantity is the amount of cooked protein in various forms of fish. For example, a 4.4 ounce frozen fried breaded fish portion yields 2.0 ounces of cooked fish while a 3.0 ounce frozen unbreaded portion provides 2.3 ounces of cooked fish.
4. Inspection: Unlike meat, not all seafood shipped in interstate commerce is inspected. The United States Department of Commerce does provide a voluntary inspection service. Purchasing fish with the "grade" mark or "packed under continuous inspection" marks--

--insures that the fish is safe, wholesome, produced in a sanitary environment, and packed in accordance with uniform quality standards.

5. Grading: The quality of the fish is indicated by grade. These grade standards are substantially above the minimum requirements for safety and edibility. While not all fishery products have grade standards, the following forms are some that do:

- Frozen raw fish fillets, portions and steaks
- Frozen fried fish fillets, portions and steaks
- Frozen fish steaks

There are two grades for seafood; A and B. Grade A is the best quality. The seafood is uniform in size, virtually free from blemishes and defects, in excellent condition and has a good odor and flavor in the cooked state. Grade B seafood is not as uniform in size or free from blemishes and defects as is Grade A. Fish graded A would be chosen for recipes where eye appeal is important. Grade B seafood would be quite suitable for many recipes where the fish is mixed with other foods or covered in a sauce.

(For more information, see pages 30-33 of the Food Buying Guide for Type A School Lunch, PA 270 and Food Buying Guide: Supplement #2.)

Writing Specifications for Bidding

Specifications give the precise description of the seafood item desired and the quantity. The specifications are written with exactness so both the buyer and seller can identify all necessary provisions. Improperly written specifications may result in receiving the wrong products.

All specifications should include the following:

1. The name of the product

2. The federal grade or inspection mark

3. The size of the containers

4. The count per case

(For more information, see page 8 of the Food Purchasing Pointers for School Food Service, #1160.)

In addition, when ordering frozen, fresh or canned fish, the following should be specified:

1. Market form

2. Fish specie

3. Pack of fish (canned)

4. Color of fish (canned tuna or salmon)

Below is a checklist used by manager X in determining the exact type of fish he wants to use in his fish portions with macaroni and cheese for 100 students, ages 10-12.

1. Name of product

____ Raw Breaded Fish Portions
__X__ Fried Breaded Fish Portions

2. Federal grades

__X__ Grade A
____ Grade B

3. Size of containers

__X__ 5 lb. box
____ 6 lb. box

4. Count per container

__X__ 4 oz. portions, 20 per 5 lb. box
____ 4 oz. portions, 24 per 6 lb. box

5. Market form

____ Raw breaded fish portions
__X__ Fried breaded fish portions

6. Species

____ Cod ____ Haddock __X__ Pollock

10 **Sample Form**

Market Order

School Halibut High School

Date Ordered April 1, 1979

Order No. 0013

Manager's Signature Susie Seafood

Filled By _____

Date Filled _____

Instruction for Completing Orders

1. *School Food Service Supervisor/Manager fills in columns 2 and 3.*
2. *Order by unit such as pound, case.*
3. *Retain one copy for your records. ____ copies should be completed.*
4. *Columns 1, 5, 6 and 7 will be filled in at central warehouse or central storage point when items are dispensed.*

1 Stock no.	2 Specification	3 Unit	4 Quantity ordered	5 Quantity distributed	6 Unit price	7 Total amount
	4 oz. fried breaded	5 lb.	5 boxes			
	portions, containing					
	60% fish, cut from fish					
	blocks. Grade A and					
	inspected.					

Total Value _____

Authorized By _____
School Food Service Supervisor

Received By _____ Date _____
Purchasing Agent

From _____

III. STORAGE OF SEAFOOD

Proper storage of seafood is important to maintain quality. Seafood is perishable and must be properly stored to avoid spoilage or food poisoning.

Frozen Fish

Frozen fish should be delivered frozen and stored at 0°F or lower until removed for thawing before cooking. Once the fish has been thawed, it should not be refrozen. At temperatures above 0°F, chemical changes occur in the fish causing loss of color, flavor, texture and nutritive value. The received frozen fish should be dated and shelved behind or under older seafood to facilitate rotation. Once properly stored, the fish may be kept frozen for 3-6 months with no loss of quality. Precooked fish and uncooked fat fish may be held in the freezer for 3 months while uncooked lean fish may be kept for 6 months. (See listing on page 4 for fat content of fish.)

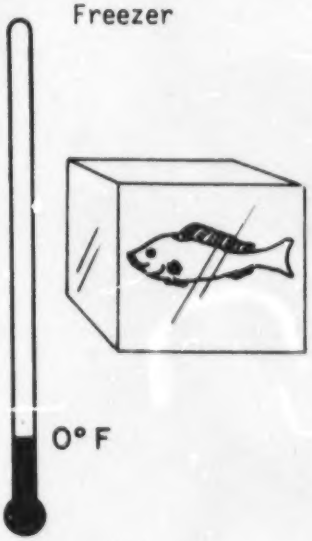
Canned Fish

Canned fish, along with all other canned foods, should be stored in a dry and cool (50-70°F) location to prevent spoilage of the food and swelling of cans. The cans should be arranged in such a way that cans shelved first are used first. Canned fish may be kept for up to one year.

Fresh Fish

Fresh fish should be delivered packed in crushed ice and should be placed in the refrigerator in its original leakproof wrapper. The fish may be held for one day at a temperature of 35-40°F.

STORAGE LIFE OF SEAFOOD

STORAGE	SPECIES	TIME
Freezer 	Fat fish - uncooked (See fat content chart page 4)	3 months
	Lean fish - uncooked (See fat content chart page 4)	6 months
	Precooked fish	3 months
	Breaded fish	3 months
Dry Storage	Canned seafood	12 months
Refrigerator	Fresh seafood	1 day

IV. PREPARATION OF SEAFOOD

Properly prepared seafood is tasty, moist and tender. Fish cooked at too high a temperature or for too long becomes tough and dry, losing flavor. When raw, finfish appear watery and translucent. After cooking, the finfish is opaque and the flesh flakes easily when pierced with a fork.

Cooked finfish has a tendency to break apart easily. To prevent this breakage, finfish should be handled as little as possible during and after cooking.

Thawing Seafood

Frozen seafood (other than breaded items) is thawed in either of two ways: in the refrigerator, or cold water. With the first method, the individual packages are placed on trays in the refrigerator and left until thawed (24-36 hours for a 1 pound package and 48-72 hours for a 5 pound package). If quicker thawing is necessary, the second method of thawing in water is used. The packages are placed in cold water for 1-2 hours for a 1 pound package and 2-3 hours for a 5 pound package. Fish should not be thawed at room temperature. This process causes loss of moisture and flavor and may cause spoilage.

Whether seafood is cooked frozen or thawed depends on its form and the way it is prepared. Fish portions and sticks are cooked frozen. Frozen and steaks may be cooked without thawing provided extra cooking time is allowed. When frozen fillets and steaks are to be breaded, they should be thawed.

METHODS OF THAWING SEAFOOD		
Method	Weight in Pounds	Time in Hours
Refrigerator	1 5	24-36 48-72
Cold water	1 5	1-2 2-3

Methods of Cooking Seafood

There are many different methods used to prepare seafood. Since baking and frying are the methods most commonly used in school cafeterias, only these two methods will be discussed.

Baking Seafood

Baking is a method of dry heat cooking. Fish is baked in a pre-heated moderate oven set at 350°F for a short time. The fish is placed in a greased baking pan and is basted with fat or baked in a sauce to prevent drying. As stated earlier, fish may be cooked from the frozen state, provided the cooking time is increased.

Frying Fish

Before fish is fried, it is usually breaded or dipped in batter. This coating keeps the fish moist inside and makes it crispy outside.

When breading seafood, the fish is floured, moistened and then crumbed. The flour absorbs the moistening agent and thereby forms an adherence base for the crumbs. The fish is first dipped in milk, then

egg and seasonings and last, rolled in crumbs. The fish should be allowed to dry for 15 minutes before frying.

The batter for batter-dipped fish should be thick enough to to adhere and coat the fish. The fish is dipped into the batter and then held over the batter allowing the excess coating to drip off.

When frying, the fish is cooked in fat. This fat needs to be heated to a high temperature below the smoking point. Smoking fat breaks down and gives the food an "off" flavor.

1. Oven Frying

Oven frying is not a true method of frying, but rather approximates fried fish. Oven fried fish do not require basting or turning during cooking.

To prepare oven fried fish, the breaded fish portions are placed on a well-greased baking sheet and are brushed with fat. The fish is then baked in a very hot oven (500°F) until it is browned and flakes easily when tested with a fork, usually 15-20 minutes.

2. Deep fat Frying

Breaded or batter-dipped fish are placed in a single layer in a fry basket or braising pan. If using a deep fat fryer, the basket is slowly lowered into the fat heated to 350°F until the fat covers the food. The fish is fried until it is golden brown and flakes easily when tested with a fork, usually about 3-5 minutes.

Other Methods

Fish are also prepared for serving in casseroles, sauces, chowders and salads. Most of these recipes specify either cooked fish or raw

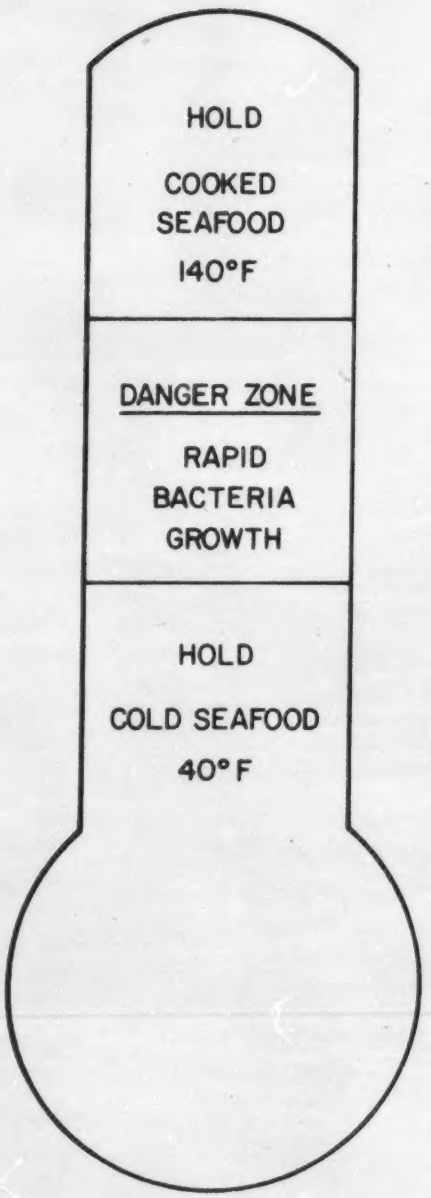
fish which is then cooked along with other ingredients in the recipe. Since the preparation methods vary from dish to dish, the recipe instructions should be followed.

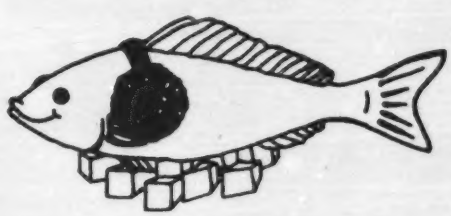
Holding and Serving Seafood

The cooked seafood should be held on the steam table for as short a period of time as possible. The longer the cooked fish is held, the more it loses quality. To avoid long holding, fish should be cooked in smaller batches prior to the various serving times.

The cooked fish held on the steam table should be kept at an internal temperature of 140°F to prevent rapid growth of bacteria. Cold seafood and seafood salads should be kept refrigerated until serving. Again, to retard bacteria growth, these dishes should be held at or below 40°F.

TEMPERATURE GUIDE FOR SAFE HOLDING OF SEAFOOD





KEEP HOT SEAFOOD HOT
AND COLD SEAFOOD COLD!

TIMETABLE FOR COOKING FISH*

METHOD OF COOKING	FORM OF FISH	TEMPERATURE (Deck/stack oven)	TIME (Deck/stack oven
Baking	Fillets	350°F	30-40 minutes
	Steaks	350°F	30-40 minutes
	Portions		
	Breaded	350°F	30-40 minutes
	Unbreaded	350°F	30-40 minutes
	Fried	400°F	15-20 minutes
	Sticks		
	Breaded	350°F	30-40 minutes
	Fried	400°F	15-20 minutes
Oven-Frying	Fillets	500°F	15-20 minutes
	Steaks	500°F	15-20 minutes
	Portions		
	Breaded	500°F	15-20 minutes
	Unbreaded	500°F	15-20 minutes
	Sticks		
	Breaded	500°F	15-20 minutes
Deep-fat Frying	Fillets	350°F	2-4 minutes
	Steaks	350°F	3-4 minutes
	Portions		
	Breaded	350°F	4-6 minutes
	Unbreaded	350°F	4-6 minutes
	Sticks		
	Breaded	350°F	3-4 minutes

*For cooking temperatures and times in convection ovens, check the manufacturers' manual.

V. SEAFOOD NUTRITION EDUCATION

The school food program not only provides nutritious meals, but also cooperates with the classroom teachers in providing nutrition education. Good nutrition is extremely important in promoting good health and learning. Since nutritional habits are established early in life, it is necessary that students be introduced to well-balanced meals and basic nutritional facts in the primary grades.

The school lunch program has the potential to be much more than merely a feeding operation. To aid in the nutritional education program, the following suggestions may be helpful.

1. Plan a special seafood day. Prior to seafood day, the cafeteria could be decorated with various seafood posters. Posters may be designed or obtained from:

   a. Dolphin Seafoods
      5903 West 130th Street
      Cleveland, OH 44130

   b. Florida Department of Natural Resources
      Crown Bldg., Room 434
      202 Blount Street
      Tallahassee, FL 32310

   c. Massachusetts Seafood Council
      Fish Pier
      Boston, MA 02210

   d. National Fisheries Institute
      1730 Pennsylvania Avenue
      Washington, DC 20006

   e. North Atlantic Seafood Association
      1220 Huron Avenue
      Cleveland, OH 44115

2. Have school lunch personnel write seafood nutrition commercials or cooperate with the Home Economics or English classes in the school. These commercials might be played over the school intercom or on a tape player in the lunchroom.

3. Sponsor a display or poster contest. Have students in the school submit posters relating to seafood and its nutritional contributions. School lunch personnel might judge the posters and present a prize (free ice cream for a week, etc.) to the winner.

4. Conduct a "Which food has the nutrient?" contest. Select a nutrient contained in the seafood serving of the day. Advertise that the persons identifying the source of the nutrient will be declared "Detective of the Day." Example: protein - fish sticks, niacin - fish portions.

5. Promote "Nutrient of the Day" campaign. On the day protein is publicized, serve fish.

6. Write nutritional content of fish dishes on cards and display them on the serving area when fish is served.

7. During spring track meets, on May Day or at a time of high sports interest in the school, sponsor a "Seafood for the Athlete" contest. Have students submit recipes and/or posters that support seafood's contribution to a healthy body.

8. Sponsor a recipe contest utilizing fish sticks or fish portions in an attractive, appealing dish.

9. Place a contest entry box in a prominent place in the lunchroom. Have students submit entries for the number of calories for the day's menu or for a specified food such as the fish entree of the day. The student(s) closest to the correct calculation should be rewarded in some manner.

10. For more advanced grade levels, utilize #9 above, but have students calculate specified nutritive values of certain dishes, for a day's menu, or for an entire week's menus.

11. Promote seafood awareness by showing films during the lunch sessions. (Similar to what is being done at Shakey's Pizza Parlors) Films may be obtained from:

    Motion Picture Service
    Dept. of Commerce - NOAA
    12231 Wilkins Avenue
    Rockville, MD 20852

    Some sample titles are:
    "Shrimp Please" - 21 minutes
    "Salmon-Catch to Can" - 14 minutes
    "Great American Fish Story" - 28 minutes
    "Fresh Out of the Water" - 14 minutes
    "Watermen of the Chesapeake" - 28 minutes
    "Flavor of Maine" - 14 minutes
    "Mullet Country" - 14 minutes
    "Florida Seafood" - 27 minutes

12. Sponsor Seafood Education Week in your school. The school lunch staff might spearhead and coordinate activities with classes in the school such as:

    Art - draw posters depicting a seafood nutritional theme.

English - develop a logo or theme for the week. Write TV, radio, and newspaper items to advertise Seafood Education Week to the school and community. Write a skit and present it to other classes or the entire school. Read stories of fishermen, set up panel discussions and/or interviews with persons in nutrition education.

Health - investigate available information on the importance of seafood for athletes. Prepare a handout for the school sports teams.

History - become familiar with the history of seafood in the United States. Develop time line charts pertaining to the seafood industry; plot major seafood industries in your state or in the United States. Investigate governmental agencies involved in fish and seafood services. Study world seafood trading.

Science - look at seafood processing; study how seafood supplies can be increased through technology. Investigate the cleansing properties of oysters and clams. Discuss ecosystems of lakes, oceans and rivers.

Home Economics - do demonstrations for nutritional seafood snacks. Prepare menus using the school lunch budget, regulations and commodities, incorporating a fish/seafood item. Investigate market forms and cost of seafoods. Prepare a seafood nutrition column for the school newspaper or issue a special information flyer.

Social Studies - explore international seafood customs. Study the role of seafood in various cultures.

Math - compare costing charts using the information developed in Home Economics classes.

The combined efforts of school food personnel, teachers and students can expand awareness and knowledge of seafood, thus encouraging the students to eat more nutritious school lunches and to have a more favorable attitude toward eating seafood at home and in restaurants.

Fish and Shellfish Buying Guide and Quantity Recipes for Type A School Lunches. Fishery Market Development Series #5. United States Department of the Interior, Fish and Wildlife Service.

Food Buying Guide for Type A School Lunches. United States Department of Agriculture, PA-270. 1972.

Food Buying Guide: Supplement #1. United States Department of Agriculture, 1977.

Food Buying Guide: Supplement #2. United States Department of Agriculture, 1978.

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Harper, Judson M. "Plate Waste". Paper presented at the Eleventh Annual Industry Seminar, American School Food Service Association. Vail, Colorado. January 25, 1977.

Quantity Recipes for Type A School Lunches. United States Department of Agriculture. PA-631.

Nutritive Value of Foods. Home and Garden Bulletin #72.